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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.              | CONFIRMATION NO.            |
|---|-------------|----------------------|----------------------------------|-----------------------------|
| 10/524,215  | 02/10/2005  | Yasuhiko Kojima      | 265769US26PCT                    | 6423                        |
| 22850   | 7590        | 07/23/2007           |                                  |                             |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      | EXAMINER<br>NARAYAN, PRATIVADI B |                             |
|   |             |                      | ART UNIT<br>1709                 | PAPER NUMBER                |
|   |             |                      | NOTIFICATION DATE<br>07/23/2007  | DELIVERY MODE<br>ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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## Office Action Summary

Application No.

10/524,215

Applicant(s)

KOJIMA ET AL.

Examiner

Prativadi B. Narayan

Art Unit

1709

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 6-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date May 04, 2005.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**  
***Election/Restrictions***

1. Applicant's election with traverse of claims 1-5 and a new claim 11, in the reply filed on June 15, 2007 is acknowledged. Amended claims 6-10 were withdrawn. The traversal is on the ground(s) that the original Restriction requirement did not explain why there is no single general inventive concept between the two groups. This is not found persuasive because there is a clear lack of unity in Groups I and II, since the common features of Groups I and II (i.e., processing chamber, mounting table, heating member and sealing member) are not contributors over prior art (e.g., see Ushigoe et al. that was discussed in the original restriction requirement), and thus cannot be considered as a common special technical feature. MPEP 1893.03 (d) states that Unity of Invention is present when the groups have a common or corresponding special technical feature. As a result, it is established that there is a lack of Unity of Invention between the two groups.

The requirement is still deemed proper and is therefore made FINAL.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1709

3. Claims 1, 4 and 11 are rejected as being unpatentable under 35 U.S.C. 102 (b) as being anticipated by Ryusuke et al. (Japanese Patent Publication No. 05-009740 with the publication date of Jan 19, 1993, hereafter '740).

Claim 1:

A substrate processing apparatus comprising:

a processing chamber (container 17 in Drawing 8 and [0004]) for accommodating a substrate (wafer 2 in Drawing 8 and [0004]) therein;

a mounting table (ceramic base 3 in Drawing 8 and [0004]) for mounting the substrate thereon;

a heating member (heating elements 4 and ceramic heater 1, as shown in Drawing 8 and [0004]) disposed in the mounting table, for heating the substrate;

a sealing member (O-ring 12 in Drawing 8 and [0005]) disposed between the mounting table and the processing chamber.

a cooling unit (water-cooled jacket 16 in Drawing 8 and [0005]), having a cooling medium (water), for cooling the sealing member by using a latent heat of vaporization of the cooling medium (the most prominent cooling mechanism of water) included therein.

Claim 4:

The apparatus of claim 1, further comprising a processing gas supply system (gas supply hole 18 in Drawing 8 and [0004]) for supplying a processing gas into the processing chamber.

Claim 11:

Claim 11 is rejected for the same reasons used in rejecting claim 1 because the water-cooled jacket is a means of suppressing temperature rise of the sealing member.

Art Unit: 1709

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 2 is rejected under USC 103 (a) as being unpatentable over '740 in view of Grosshart (U.S. Patent No. 5,948,283, with the publication date of Sep 7, 1999, hereafter, '283) and further in view of Kim (U.S. Patent no. 5,983,998 with the publication date of Nov 16, 1999, hereafter '998).

Claim 2:

'740 anticipates all the limitations of claim 1, as described above.

'740 teaches the presence of a cooling unit (water-cooled jacket), but does not specifically teach the conventionally known details of the cooling unit e.g., depressurized airtight casing.

Art Unit: 1709

'283 (whose field of invention is cooling substrates in plasma-related semiconductor manufacturing Col 1 lines 6-9, Col 2 lines 22-26 and Col 2 lines 44-48) teaches the use of refrigeration sources for achieving steady-state thermal environment (Col 2 lines 4-21 and Col 6 lines 14-36). '998 (whose field of invention relates to cooling systems Col 1 lines 10-15) teaches the well-known details of refrigeration e.g., depressurized refrigerant (tube 4 in Fig. 1 and Col 1 lines 16-27) for maintaining optimum temperature conditions (Col 1 lines 10-15).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used depressurized refrigerants in the cooling unit of '740 to have achieved steady-state thermal environment for the substrates.

7. Claim 3 is rejected under USC 103 (a) as being unpatentable over '740 in view of Kazama et al. (U.S. Patent No. 5,567,267 with the publication date of Oct 22, 1996, hereafter '267).

'740 anticipates all the limitations of claim 1, as described above.

'740 teaches the presence of a thermocouple (item 21 in drawing 8 and [0006]) to measure the temperature of the area near the sealing member, but does not specifically teach the use of a cooling unit controller for controlling the cooling unit based on the measurement result of the temperature sensor (or, thermocouple).

'267 (whose field of invention relates to plasma etching apparatus in the semiconductor industry (Col 1 lines 7-13), similar to '740) teaches the use of a control system (CPU 40 in Fig.1 and Col 6 lines 29-41) that controls the temperature sensor (item 21 in Fig.1 and Col 5 lines 5-23) and the cooling unit (item 27 in Fig. 1 and Col 6 lines 29-41) for optimum usage of the refrigerant and susceptor temperature control (Col 7 lines 31-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a cooling control system as taught by '267 in the

Art Unit: 1709

apparatus of '740 to have optimized the usage of the refrigerant and susceptor temperature control.

8. Claim 5 is rejected under USC 103 (a) as being unpatentable over '740 in view of Otsuki (U.S. Patent Application Publication No. 2001/0003271 A1 with the publication date of Jun 14, 2001, hereafter '271).

'740 anticipates all the limitations of claim 4, as described above.

'740 teaches the presence of a CVD gas supply (item 18 in drawing 8 and [0004]), but does not specifically teach the use of a plurality of gas supplies and gas supply controllers.

'271 (whose field of invention relates to a CVD apparatus for semiconductors (Abstract and [0002]), similar to '740) teaches the use of a plurality gas supplies (items 41-45 in Fig. 1 and [0051]) and gas supply controllers (mass flow controllers, items 52 in Fig 1 and [0051]) for supplying discharge gases alternately [0049].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a plurality of gas supplies and gas supply controllers in the apparatus of '740 to have had the ability of supplying discharge gases alternately.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prativadi B. Narayan whose telephone number is 571-270-1881. The examiner can normally be reached on MTh 8:00 to 6 PM ET.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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MICHAEL B. CLEVELAND  
SUPERVISORY PATENT EXAMINER